

Influence of artificial intelligence (AI) on firm performance: the business value of AI-based transformation projects

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Abstract

PurposeThe main purpose of our study is to analyze the influence of Artificial Intelligence (AI) on firm performance, notably by building on the business value of AI-based transformation projects. This study was conducted using a four-step sequential approach: (1) analysis of AI and AI concepts/technologies; (2) in-depth exploration of case studies from a great number of industrial sectors; (3) data collection from the databases (websites) of AI-based solution providers; and (4) a review of AI literature to identify their impact on the performance of organizations while highlighting the business value of AI-enabled projects transformation within organizations.

Design/methodology/approachThis study has called on the theory of IT capabilities to seize the influence of AI business value on firm performance (at the organizational and process levels). The research process (responding to the research question, making discussions, interpretations and comparisons, and formulating recommendations) was based on a review of 500 case studies from IBM, AWS, Cloudera, Nvidia, Conversica, Universal Robots websites, etc. Studying the influence of AI on the performance of organizations, and more specifically, of the business value of such organizations' AI-enabled transformation projects, required us to make an archival data analysis following the three steps, namely the conceptual phase, the refinement and development phase, and the assessment phase.

FindingsAI covers a wide range of technologies, including machine translation, chatbots and self-learning algorithms, all of which can allow individuals to better understand their environment and act accordingly. Organizations have been adopting AI technological innovations with a view to adapting to or disrupting their ecosystem while developing and optimizing their strategic and competitive advantages. AI fully expresses its potential through its ability to optimize existing processes and improve automation, information and transformation effects, but also to detect, predict and interact with humans. Thus, the results of our study have highlighted such AI benefits in organizations, and more specifically, its ability to improve on performance at both the organizational (financial, marketing and administrative) and process levels. By building on these AI attributes, organizations can, therefore, enhance the business value of their transformed projects. The same results also showed that organizations achieve performance through AI capabilities only when they use their features/technologies to reconfigure their processes.

Research limitations/implicationsAI obviously influences the way businesses are done today. Therefore, practitioners and researchers need to consider AI as a valuable support or even a pilot for a new business model. For the purpose of our study, we adopted a research framework geared toward a more inclusive and comprehensive approach so as to better account for the intangible benefits of AI within organizations. In terms of interest, this study nurtures a scientific interest, which aims at proposing a model for analyzing the influence of AI on the performance of organizations, and at the same time, filling the associated gap in the literature. As for the managerial interest, our study aims to provide managers with elements to be reconfigured or added in order to take advantage of the full benefits of AI, and therefore improve organizations' performance, the profitability of their investments in AI transformation projects, and some competitive advantage. This study also allows managers to consider AI not as a single technology but as a set/combination of several different configurations of IT in the various company's business areas because multiple key elements must be brought together to ensure the success of AI: data, talent mix, domain knowledge, key decisions, external partnerships and scalable infrastructure.

Originality/valueThis article analyses case studies on the reuse of secondary data from AI deployment reports in organizations. The transformation of projects based on the use of AI focuses mainly on business process innovations and indirectly on those occurring at the organizational level. Thus, 500 case studies are being examined to provide significant and tangible evidence about the business value of AI-based projects and the impact of AI on firm performance. More specifically, this article, through these case studies, exposes the influence of AI at both the organizational and process performance levels, while considering it not as a single technology but as a set/combination of the several different configurations of IT in various industries.